ROUTING AND RECORD SHEET

SUBJECT: (Optional)

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	4 March 1983	

TO: (Officer designation, room number, and building)	DATE RECEIVED	DATE FORWARDED	OFFICER'S INITIALS	COMMENTS (Number each comment to show from whom to whom. Draw a line across column after each comment.)
1. EO/DDA 7D24, HQS.				FYI, here is the latest on the status of the production of the DASH-8. Vern has been invited to the rollout ceremony in Canada next month and is planning to attend.
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FORM 1-79 **610** USE PREVIOUS EDITIONS

De Havilland Nears Rollout of DHC-8

By David M. North

Downsview, Ont.—De Havilland Aircraft of Canada's 36-passenger DHC-8 is scheduled to roll out in mid-April with 45 firm orders and 74 options. Deliveries of the commuter and corporate aircraft are planned to begin in the fall of 1984.

The DHC-8, which is powered by two Pratt & Whitney of Canada PW120 turboprop engines, is the third turboprop-powered aircraft in the 30-50-passenger category to be introduced in the commuter and corporate market in a four-year span.

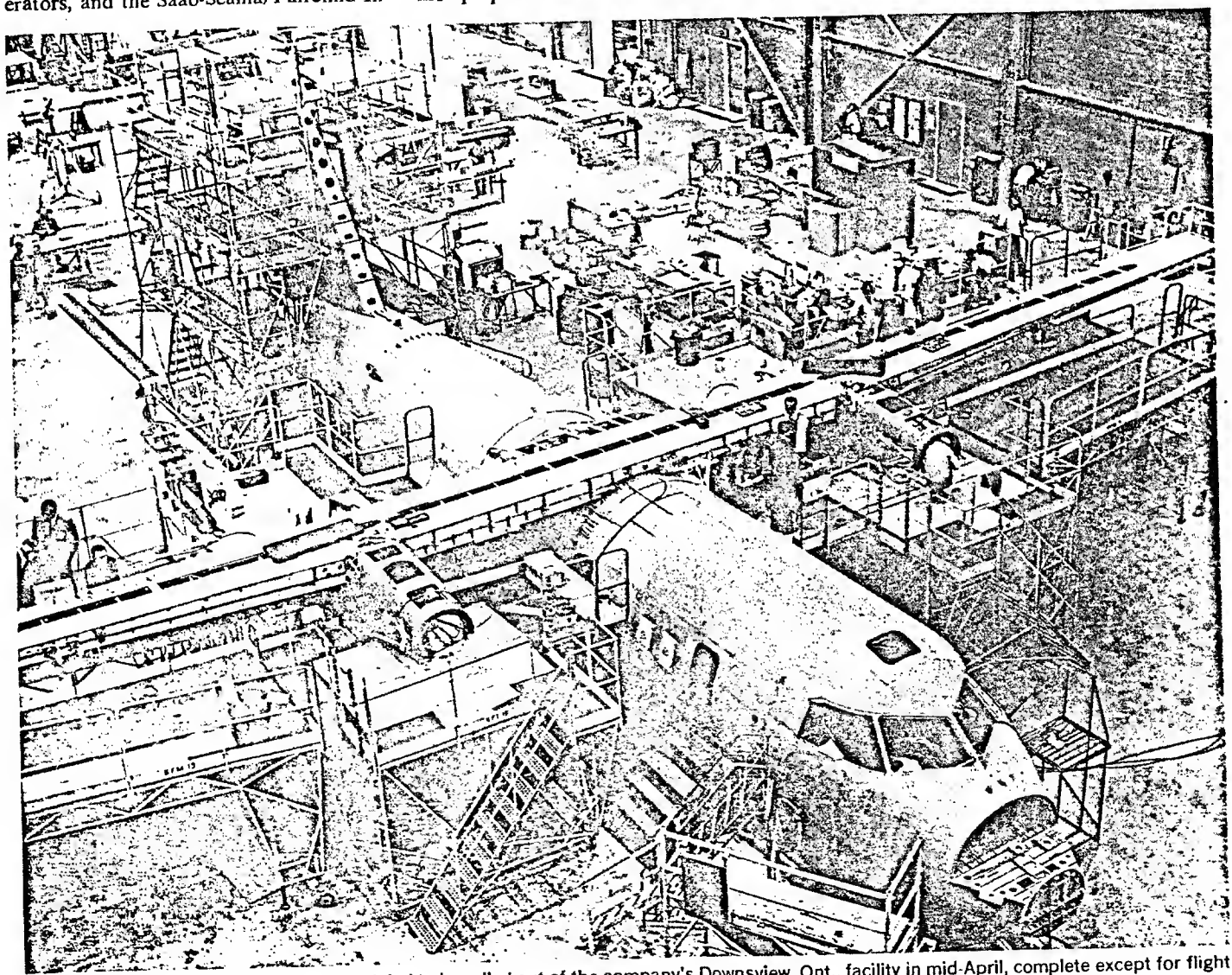
Preceding the DHC-8 were the Short Brothers 36-passenger SD 360, recently put into service with U. S. commuter operators, and the Saab-Scania/Fairchild Industries 340, scheduled to enter service in April, 1984.

The DHC-8 will be followed by the 30-40-passenger CASA/Nurtanio CN-235 in 1984, the Embraer EMB-120 Brasilia and the Aerospatiale/Aeritalia ATR42 in 1985, if these commuter aircraft development plans adhere to prior schedules. De Havilland officials consider all these aircraft except the CN-235, which they believe was designed for a specialized market, as potential competitors to the DHC-8.

De Havilland's timetable for the DHC-8 includes first flight in late June, approximately two months after rollout of the first preproduction aircraft. The first aircraft will be complete with avionics and aircraft systems, minus flight test equipment, at the time of the rollout, de Havilland officials said.

The flight test program includes four preproduction aircraft and a total of 1,500 flight hours. The first aircraft is scheduled for 550 hr. of flight test, involved primarily with initial evaluations, stability and control, autopilot and ice protection testing. The No. 2 aircraft, scheduled to fly in late 1983, will be used to check performance of the engines, and the fuel, electrical, hydraulic and environmental control systems. A total of 500 hr. is planned for this aircraft.

A third aircraft is scheduled to enter



De Havilland of Canada's DHC-8 is scheduled to be rolled out of the company's Downsview, Ont., facility in mid-April, complete except for flight test equipment. About 35% of the cost of the 36-passenger commuter and corporate aircraft is contributed by de Havilland, 20% by the Pratt & Whitney PW120 engines, 22% by U. S. firms, primarily avionics systems, and the remainder by other Canadian and British manufacturers.

Beech Orders Turbine Aircraft Simulators

Beech Aircraft Corp. has ordered five simulators from American Airlines Training Corp. for installation in a $14-million training facility under construction at the manufacturer's Wichita, Kan., facility.

First simulator, for the Beech B200 Super King Air, is scheduled to be delivered in May, 1984. The remainder, covering other models of Beech turbine-powered aircraft, will be delivered by the end of next year.

Although the simulators will be installed on fixed bases, they are being designed to be upgraded with six-degree-of-motion bases and computer-generated visual systems in the future. The facility will have a high-bay area that will permit motion bases to be fitted to the simulators.

The simulators will be equipped with a Series 32 computer and a color graphics instructor station provided by Systems Engineering Laboratories, Inc., Ft. Lauderdale, Fla.; a control loader from McFadden Electronics Co., South Gate, Calif., and software provided by Appli-Mation, Inc., Orlando, Fla.

The simulators will contain an instructor's station. In-flight emergencies can be introduced from these stations for action by the students.

the flight test program by the end of 1983. It will be used to test propeller stress, noise levels, lightweight handling and the avionics and antenna system. Production PW120 turboprop engines will be flown on the fourth flight test aircraft in early 1984. The No. 4 preproduction aircraft will be used for stability and control verification and function and reliability testing.

Structural testing to certificate the aircraft to Federal Aviation Regulations Part 25, through Amendment 51 standards, will be completed on three separate segments of the aircraft. Incorporation of damage tolerance requirements and a fail-safe design with a crack-free fatigue life of at least 40,000 hr. are objectives.

The three segments of the aircraft to undergo separate structural testing are the front fuselage, rear fuselage and empennage, and the wing and engine nacelles with a small segment of the center fuselage attached. This method of structural testing will allow the company to continue testing on the other two structures, should a crack be discovered in one of the three test structures.

De Havilland plans to certificate the DHC-8 in September, 1984, and make first deliveries soon after Federal Aviation Administration approval. De Havilland will retain one of the four preproduction aircraft as an engineering testbed, one will become a demonstrator and the other two will be sold.

Engine Certification

Certification of the Pratt & Whitney PW120 engines is running concurrently with that of the aircraft. Pratt & Whitney has accumulated more than 3,800 hr. on PW100 series engines since the first complete engine run occurred in March, 1981. The company, based in Montreal, intends to have at least eight engines in the development program by the end of 1983, and a total of 7,500 hr. on development engines. Certification of the PW120 turboprop engine is planned for late 1983.

Once the DHC-8 is certified, deliveries will begin to the more than 13 operators holding the 45 firm orders for the aircraft. A total of 16 firm orders is held by operators in Canada, 25 by U. S. operators and four by New Guinea's Talair Pty. Ten options are held by Canadian commuters, 25 by U. S. operators and 39 are carried by operators in other countries.

Air Atonabee, based in Peterborough, Ontario, is the single largest Canadian purchaser to date, with a $30-million order for five aircraft. Time Air has orders for four, and NorOntair and Trans North Air each have orders for two aircraft.

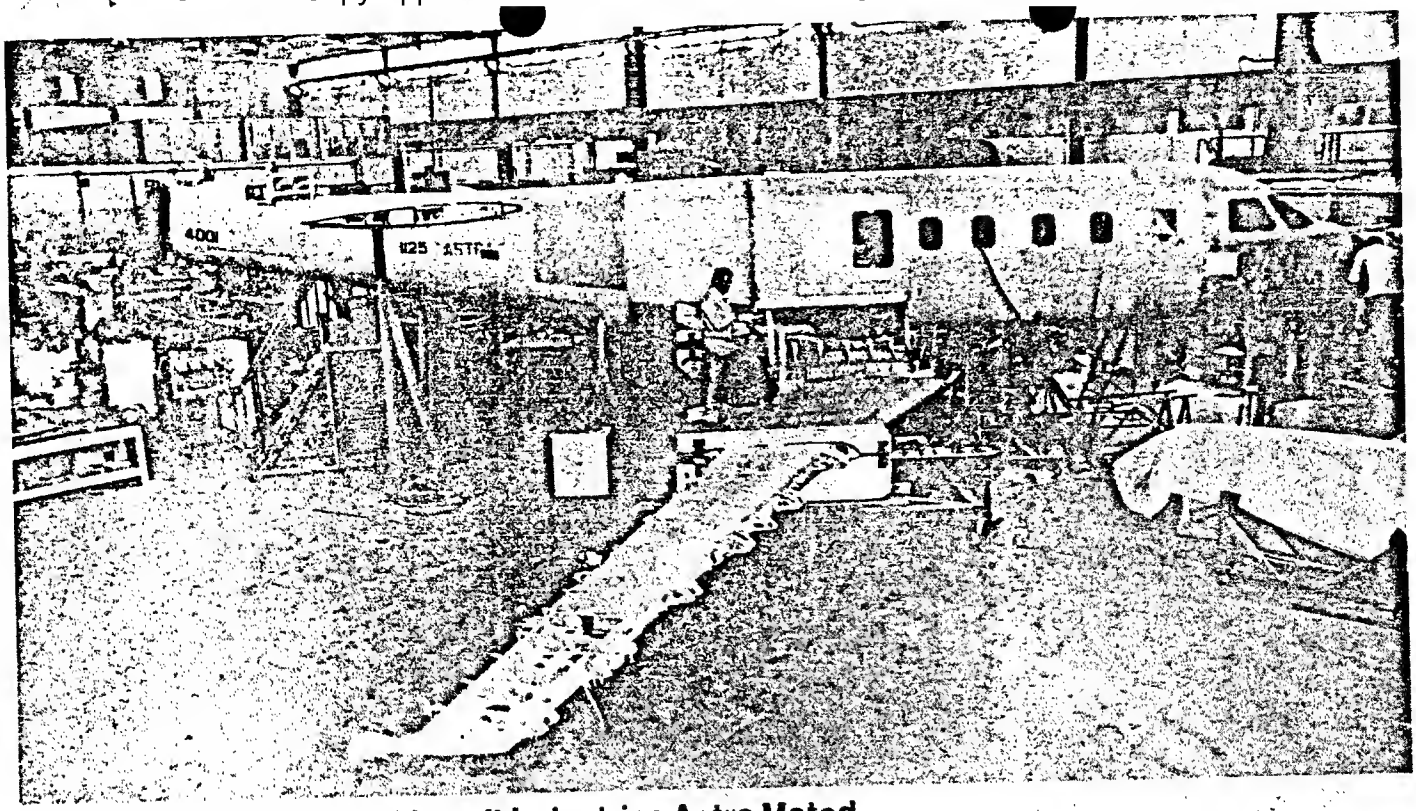
In the U. S., Henson Airlines has signed contracts for eight, Rio Airways for six and Southern Jersey for four. Aviation Enterprises and Mesaba Airlines each have orders for three.

DHC-8 Deliveries

De Havilland plans to deliver four DHC-8s in 1984 and 40 in 1985. The production rate is planned to reach six per month in January, 1986, but the actual rate in 1986 could vary, depending on the commuter market and customer response.

Innotech Aviation, de Havilland's exclusive distributor for the corporate DHC 8 in Canada and the U. S., expects to deliver its first aircraft in 1985. This will be followed by at least five more the same year and 8-12 annually during the next 10 years. Innotech will complete the interior of the aircraft it sells in North America while de Havilland is responsible for the sales and completion for other corporate DHC-8s in the international market.

The corporate version of the DHC-8 is being paced by certification of the higher fuel capacity wing to be fitted on it. The commuter version has a wing fuel capacity of 5,875 lb., and the corporate versio



Wing, Fuselage of Israel Aircraft Industries Astra Mated

Wing and fuselage of the first prototype Israel Aircraft Industries Astra corporate jet aircraft were mated in January. Rollout of the Astra, which is powered by Garrett TFE731 turbofan powerplants, is expected later this year, and deliveries are scheduled to begin in 1985. Range of the aircraft, which has a ramp weight of 22,850 lb., is expected to be approximately 3,000 naut. mi. at a cruise speed of Mach 0.8.

of the aircraft has a total fuel capacity of 8,200 lb. The additional fuel is carried in wing tanks between the engine nacelles and the fuselage.

Innotech officials view the initial market for the corporate DHC-8 as a replacement aircraft for the approximately 100 older Grumman Gulfstream 1s, Fokker F-27s and Convair 580s used in second-level management shuttle-type operations. Corporate aircraft purchased for this mission are expected to be multiple-aircraft sales to individual operators, Innotech officials said. Innotech has one order for the corporate aircraft from an operator in Canada.

De Havilland officials also see a market for the DHC-8 as a military reconnaissance aircraft and a utility transport. A long-term goal of de Havilland is the possible replacement of the Canadian air force's Grumman S-2F Trackers with DHC-8s for the maritime surveillance mission. The Canadian armed forces also will need a search and rescue aircraft and a navigation trainer in coming years, de Havilland officials said. The company also is discussing military applications with other countries.

The aircraft de Havilland plans to deliver to commuter operators has a maximum takeoff weight of 30,500 lb. and a maximum landing weight of 30,000 lb. Maximum zero fuel weight is planned at 28,000 lb., and the operational empty weight with two pilots and one attendant is predicted to be 20,176 lb. Maximum usable fuel is 5,750 lb. and maximum payload is planned at 7,824 lb.

The DHC-8 has been designed to carry 36 passengers on four 100-naut.-mi. segments or one 600-naut.-mi. flight under instrument conditions with fuel reserves. Carrying a payload of 4,000 lb., the aircraft has a range of approximately 1,300 naut. mi. with IFR reserves and flying at long-range cruise speeds.

Takeoff field length is 2,710 ft. on a standard day while carrying 36 passengers at maximum gross weight. The landing field length requirement under the same circumstances is 2,980 ft. Rate of climb with two engines is 2,070 fpm., and with one engine inoperative, the rate of climb is predicted to be 530 fpm.

Normal takeoff rating of the PW120 turboprop engines is 1,800 shp., or including the thrust gained by the exhaust gases, 1,892 eshp. An automatic feature of the twin-spool engine allows 2,000 shp. to be carried on one engine after a torque measuring device senses inadequate torque on one engine. The 1,800 shp. and 2,000 shp. are available to 82F.

The PW120 initially will have a time between overhaul of 1,500 hr. Pratt & Whitney expects to achieve a time between overhaul of 6,000 hr. 3.5 years after initiating an engine fleet leader program with at least two commuter operators. The TBO increase is expected to reach 6,000 hr. for mature production engines five years after service initiation.

Based on the Pratt & Whitney estimates of engine performance, de Havilland predicts the total direct operating cost in 1982 U. S. dollars for a 200-naut.-mi. trip will be $619. This direct operating cost can be subdivided further to include a cost of $3.10 per naut. mi. or a total operating cost of $17.20 per seat. De Havilland's figures include a 50% burden applied to direct maintenance costs.

De Havilland has increased the percentage of composite materials from 5% of empty weight in the DHC-7 to 10% in the DHC-8. Included in the list of composite material sections of the DHC-8 are wing leading edges, engine nacelle intake and bottom cowls, dorsal fin, gear doors and nose and tail cones.

The flaps are of the single-slotted Fowler type. Flight spoilers are used to assist the ailerons at speeds below 205 kt. The main landing gear is housed in the engine nacelles below the exhaust duct, and the nose landing gear is carried in front of the forward pressure bulkhead.

Standard seating configuration for the commuter version is nine rows of four abreast in the cabin. A lavatory and buffet area is located across from the single-piece airstair door. The seats are contoured with fixed backs providing for a 31-in. seat pitch and a 13.5-in. underseat clear-

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ance. A movable bulkhead is located approximately one frame ahead of the 50 × 60-in. cargo door on the left side of the rear fuselage. Volume of the cargo area in the standard 36-passenger configuration is 300 cu. ft.

If the bulkhead is moved forward to reduce the cabin to a 28-passenger capacity, the cargo volume increases to 534 cu. ft. An all-cargo cabin configuration has 1,100 cu. ft. of space. De Havilland officials had considered installing a forward cargo door as optional but decided the rear cargo door was ample to accommodate most loads that would be carried in the aircraft.

Standard avionics in the commuter version include Collins Pro-Line communication and navigation systems. A Sperry Primus 800 weather radar is standard with the aircraft as is a dual Sperry attitude and heading reference system. The automatic flight control system is the Sperry DFZ-800 system, including digital flight directors, autopilots and air data systems.

The standard avionics system is included in the price of the corporate version. The corporate version also will have the Sperry EDZ-800 electronic flight instrument system as standard equipment, while it will be optional on the commuter aircraft. The Sperry EDZ-800 includes the attitude and horizontal situation displays.

Also included in the standard corporate DHC-8 is the Collins FMS-90 flight management system combining VLF/Omega and area navigation and the Sperry VN800 vertical navigation system.

A Titan series auxiliary power unit from Solar Turbines International's Turbomach Div. has been selected to provide ground power for the corporate version. The unit also will be offered as an optional item on the commuter aircraft.

Innotech will provide interior configurations to match customer requirements, but it does have stock 12-, 17- and 24-passenger layouts.

The additional 2,325 lb. of fuel carried by the corporate version will give the aircraft more than a 2,000-naut.-mi. ferry range under instrument flight conditions.

With a payload of 2,000 lb., the corporate aircraft has a range of 1,750 naut. mi. at maximum cruise and 1,900 naut. mi. at long-range cruise speeds, both under instrument flight fuel reserve requirements. Maximum cruise for the aircraft is predicted to be 270 kt. at 15,000 ft. at an en route weight of 29,000 lb.

Price for the corporate version from Innotech is $5.65 million in U. S. dollars at January, 1982, levels. This includes the corporate avionics package, a 17-passenger interior and the APU.

The price of the commuter version, also in January, 1982, U. S. dollars, is $4.8 million. This figure does not include the APU or the electronic flight instrumen system avionics package standard in th corporate aircraft. It does include th standard 36-passenger interior installed b de Havilland.

Spares and field support for the ne corporate aircraft will be provided by In notech as well as by de Havilland an Pratt & Whitney. The commuter aircra will be supported by de Havilland an Pratt & Whitney from their worldwi locations. □

Noise Restriction Settlement Expected

Los Angeles—Resolution of a long-standing dispute over noise restrictions at Santa Monica Airport here may be achieved by the end of this year, following dismissal of a suit in U. S. District Court challenging the noise restrictions.

National Business Aircraft Assn. (NBAA) and the General Aviation Manufacturers Assn. (GAMA) filed suit against the city-owned airport in 1979 challenging an 85-db. limit on general aviation traffic, which they contended was a ban on jet aircraft. Gunnell Aviation, Inc., a fixed-based operator at the airport, later joined the suit, which became known as "Santa Monica 2."

Joint motion to dismiss the suit was accepted by U. S. District Court Judge Irving R. Hill. The motion was predicated on an understanding between the plaintiffs and city officials that a workable compromise to the noise problem could be achieved by November for inclusion in the Santa Monica Airport master plan.

Santa Monica Airport, located about 15 mi. northwest of downtown Los Angeles, is a high-volume airport for general aviation in the Los Angeles basin. It is surrounded by single-family homes and has been the target of complaints by residents who contend there is too much aircraft-generated noise.

Controversy over aircraft noise at Santa Monica Airport resulted in 1967 in a curfew on jet operations. In 1975, the airport imposed a ban on all jet aircraft. City officials also established a single-event noise exposure level of 100 db., imposed helicopter-training flight restrictions, and limited touch-and-go landings during weekend hours (AW&ST July 17, 1978, p. 13).

A 1979 court decision, later upheld in the 9th Circuit Court of Appeals, retained the restrictions on general aviation traffic but overturned the ban on jet aircraft.

The city of Santa Monica then lowered the airport noise exposure level to 85 db., a move that prompted the legal challenge by the NBAA and GAMA.

"Without a doubt, Santa Monica 2 was a battle over the principle of a jet ban," GAMA's Drew Steketee said. "Discrimination against one class of aircraft was the bellwether issue that was settled. We feel there would have been numerous jet bans had we not made the effort we did."

There are no other domestic municipal airports that ban jet aircraft traffic, according to the Federal Aviation Administration.

"The city of Santa Monica can begin to work toward an environmentally sound airport that will accommodate general aviation traffic," Steketee added. "The city has agreed to work closely with GAMA and the National Business Aircraft Assn., and we'll be monitoring developments closely."

The city of Santa Monica, meanwhile, has reimposed the 100-db. limit at Santa Monica Airport. A consulting firm has been retained to hold public hearings on the noise issue. The firm's recommendations are scheduled to be submitted to the city council Nov. 15 for possible inclusion in the Santa Monica Airport master plan.

"We're not just nabbing consultants to do some work and then popping it on the city council in November," Stephen S. Stark, Santa Monica's assistant city attorney, said. "This process involves public participation—fairly constant contacts with the people that use the airport, both locally and nationally. We're also going to be talking to people who live in the neighborhoods affected by the airport."

Santa Monica Airport averages one or two jet aircraft operations a day, primarily with Cessna Citation or Learjet aircraft. Airport rule violations, usually involving decibel infractions, occur at the average rate of one or two a month.

"With pilots practicing noise-abatement techniques, they can have an environmentally sound airport out there," Steketee said "We are not endorsing the 100-db. limit or opposing it, bu provisions for the 100-db. threshold are contained in the join motion to dismiss without prejudice, and GAMA has signed tha motion."

Traffic at the facility has decreased during the past severa years. There were 184,152 general aviation operations at Sant Monica Airport in 1982, 189,433 in 1981, 210,171 in 198 and 256,769 in 1979, according to figures released by the FA

Santa Monica's history of limiting general aviation traffic ma have contributed to the image of an airport that is not responsiv to general aviation needs, Stark said.